ATTACHMENT 1

WASTE ANALYSIS PLAN

TABLE OF CONTENTS

WASTE ANALYSIS PLAN

1.0 Overview

The objective of the waste analysis plan (WAP) is to describe the procedures that will be undertaken to obtain sufficient information about waste streams to operate the facility in accordance with applicable permit requirements. More specifically, the waste analysis plan ensures that wastes accepted are appropriate for management at the facility and that the wastes that arrive at the facility are the same as those evaluated in the profiling process.

This plan also anticipates that wastes will be generated on-site and will ultimately be accepted for storage and management at this facility. These wastes will be subject to the same waste analysis procedures as wastes accepted from off-site sources except for incoming load procedures which are not required for site generated wastes.

In accordance with R315-8-2.4, 40 CFR 264.13(b), (c), 270.14(b)(3), and 40 CFR 761, this waste analysis plan addresses the RCRA regulated and TSCA regulated PCB wastes that are managed at the facility. This facility operates as both a transfer and storage facility.

The purpose of this WAP is to establish necessary sampling methodologies, analytical techniques, and overall procedures for characterization, acceptance, and management of hazardous wastes accepted or generated at the facility.

This waste analysis plan establishes the following:

- The procedures for determining that waste streams will be acceptable for management at the facility and for notifying the generator that the waste will be accepted.
- The procedures for characterizing the wastes and establishing appropriate management strategies.
- The frequency and methods for sampling and analyzing incoming loads of waste.
- The parameters for which each waste will be analyzed and the rationale for the selection of these parameters.

2.0 Identification of Wastes to be Managed

Materials acceptable for storage at Northeast Casualty Real Property Clive include: wastes regulated under the Resource Conservation and Recovery Act (RCRA), the Hazardous and Solid Waste Amendments (HSWA), Superfund (CERCLA), and the Toxic Substances Control Act (TSCA). Clive may also accept non-hazardous waste such as household hazardous waste and industrial waste.

Wastes are accepted in a variety of physical forms, including liquids, sludges, and solids, although these wastes may not arrive in a 100% homogenous form and many waste streams are a

mixture of wastes codes. Modules 2 and 3 of this permit identify the wastes and waste codes that are acceptable and prohibited for management in the waste management units at the facility.

The Clive facility may also temporarily (ten days or less) hold wastes manifested to another facility in accordance with 40 CFR 263.12. This is referred to as transfer operations. There are no restrictions on waste codes for transfer operations.

The types of PCB materials accepted for storage and held for transfer operations at the facility are summarized on Table 1. Definitions of the terms used in the table are given. These wastes are regulated under the Toxic Substances Control Act (TSCA), and may be commingled with RCRA-regulated wastes.

Table 1 Summary of TSCA Wastes for Storage

PCB TYPE [1]	CLASS	TYPICAL PCB CONCENTRATION (DRY WT)
Oil	Liquid	0-90%
Water	Liquid	0-10%
Articles & Capacitors	Solid	20%
Miscellaneous Solids	Solid	0-10%
Soils, Spill Cleanup	Solid, Sludge	< 50%

1 Oil is a dielectric liquid containing PCB and a chlorinated solvent and is hydrocarbon based; miscellaneous solids means gloves, protective clothing, debris, etc.; soils means dirt, earth, rock.

3.0 Waste Characterization

This section describes the procedures that are followed for approving a waste stream for management at the facility, sampling and analyzing or inspecting incoming loads, and resolving discrepancies that may occur upon receipt of the waste. Because of differences in physical form, packaging, sampling requirements and management options for the many waste types that will be handled at the facility, and since the ability to sample and/or analyze the different waste

matrices varies, different procedures are necessary. Section 3.1 describes the procedures for most waste categories. Sections 3.2 through 3.6 describe alternate procedures for wastes with special circumstances that do not fit into the procedures of Section 3.1. Clive will clearly document the waste characterization procedure (i.e., 3.1, 3.2 etc.) that applies to each waste stream accepted at the facility. If more than one characterization procedure applies to a given waste stream, Clive will choose one of the applicable characterization procedures and document that designation.

3.1 Routine Wastes

3.1.1 Profile Approval Process (Routine Wastes)

Before Clive can approve a waste stream for storage and/or treatment at the facility, a completed Waste Profile Sheet must be provided by the generator. When the profile information is determined to be complete, it will be reviewed in order to assess the acceptability of the waste stream for management at the facility. These profile approval procedures occur prior to notifying the generator that the waste stream is acceptable for management at the Clive facility.

Waste Profile Sheets contain information about the generator, physical and chemical characteristics of the waste, process generating the waste, applicable waste codes, applicable DOT shipping name, and a generator certification that the information provided is accurate. The generator must also certify that the waste is not one of the types prohibited at the Clive facility. The following list details the minimum information that must be supplied as part of the Waste Profile Sheet:

- Generator Information
  - Generator
  - Address
  - Facility Contact
  - Phone #
  - Generator EPA ID#
- General Information
  - Generating Process
  - Common Name of Waste
  - Rate of Generation
  - DOT Shipping Name
  - DOT Hazard Class
  - EPA Waste Codes
- Chemical Composition
  - List of Chemical Constituents and Concentrations
- Physical Description
  - Physical Description
  - Physical State
  - Phases/Layering
  - % Free Liquid
- Regulatory Information

Regulated or Licensed Radioactive Waste
Regulated Medical Waste
Dioxin Listed Waste
TSCA Regulated Waste

Generator Certification

Certification signed by the generator that the information supplied on the Waste Profile Sheet and any attachments or supplements represent a complete and accurate description of the waste.

Following the review of the Waste Profile Sheet, the waste stream is evaluated for management at the facility. This evaluation includes a review of:

-Appropriate documents to ensure that acceptance of the waste material at Clive will be in compliance with all applicable federal, state, and local laws and regulations.

-Existing storage facilities and capabilities to ensure that the waste material can be satisfactorily managed by Clive or an off-site facility.

-The physical and chemical characteristics of the waste material to ensure that the material is compatible with other wastes present at the facility.

-The waste characterization information and available analytical data to ensure that the waste material does not contain any specific waste codes, compounds, or properties that are prohibited at Clive.

All profiles for all waste streams must be approved by the waste acceptance personnel. Final profile approval is recorded electronically in the WINWEB system at Aragonite and includes the individual issuing the approval and a date/time stamp of when the final approval was issued. Following approval of the candidate waste stream and prior to shipment of the waste, the generator is notified in writing that the Clive facility has the appropriate permits for, and will accept the waste stream in accordance with Condition 2.B. and 40 CFR §264.12(b).

At a minimum, the profile evaluation is repeated when a generator notifies Clive that the process generating the waste has changed (e.g., when the raw materials to the process have changed), if Clive has reason to suspect that the waste is in non-conformance with profile documentation, or annually.

For an annual recertification, Clive will ask the generator to note any changes in the waste stream or to certify that the waste stream has not changed. After a review of the generator's certification, the profile will be recertified. If there are changes in the waste stream which do not result in the waste stream being unacceptable, the profile will be updated and recertified. If there are changes in the waste stream which result in the waste stream becoming unacceptable, the profile will be canceled and the generator notified.

If the waste is approved for management at the facility, a unique identification number is assigned to the waste stream. This number is used to track the material through the subsequent stages of the waste management process.

3.1.2 Load Acceptance and Handling of Discrepancies (Routine Wastes)

If the waste profile is approved, the waste may be scheduled for shipment to the facility. Upon arrival at the facility, the waste is inspected, sampled, and analyzed prior to it being accepted or commingled with other waste streams. This serves two purposes. First, it compares the waste characteristics of the actual load with those determined in the profile approval process and those listed on the waste manifest. Second, it establishes the characteristics that identify proper management of the waste while at the facility. Facility-generated wastes are not subject to the incoming load procedures described in this Section.

Incoming load samples collected at Clean Harbors Aragonite or Clean Harbors Grassy Mountain may be used in lieu of taking samples of the waste when it arrives at the Clive facility. The waste stream must still have an approved profile issued by Northeast Casualty Real Property Clive and the analytical results from sampling at Aragonite or Grassy Mountain must be sent to Clive. The facility collecting the samples must follow the same sampling methods as prescribed in this plan. The analysis must be performed by Clean Harbors Aragonite, Clean Harbors Grassy Mountain, or an alternate off-site lab using the methods specified for incoming load samples in this plan. For example: a waste stream is shipped to Clean Harbors Aragonite where it is inspected, sampled and all the necessary incoming load analyses are conducted. These results and the waste are sent to Northeast Casualty Real Property Clive where the waste may be accepted without taking additional incoming load samples provided the analytical results from Aragonite conform to the approved profile.

Clive determines the acceptability of the waste based on:

-the degree of agreement between the waste profile and the load analyses;
-permit conditions at the facility; and
-the availability of proper waste management techniques.

Waste is not accepted until the waste has been determined to match the profile or all discrepancies have been adequately resolved.

Potential discrepancies for waste shipments include differences in quantity and type between the manifested waste and the waste actually received. To check for quantity discrepancies, the number of containers, or the weight if it is a bulk shipment, is reconciled with the manifest. The number of containers must be correct; there is no tolerance. The weight of bulk shipments must be within ± 10% of the manifested weight. Waste type discrepancies are determined by inspection and by comparing the analyses of the incoming load to the profile information and the manifest description. Changes in the proper shipping name, additional waste codes, etc. are noted. If any of these conditions occur, the manifest is considered discrepant and actions will be taken to reconcile the discrepancy.

If discrepancies in the quantity of waste occur, the generator will be contacted by Clive to resolve the difference. If discrepancies of waste type occur, one or more of the following actions occur to resolve the discrepancy:

- The sampling and analytical data are reviewed to verify that they are indeed correct.

- Additional analyses may be necessary to resolve discrepancies or to re-profile the waste.

- The generator or authorized representative is contacted. In cases where the waste is amenable to management at the facility the discrepancy is resolved between Clive and the generator or authorized representative. This may involve creating a new profile for the waste or updating the existing profile. Waste that is not amenable to acceptance by Clive is rejected.

The manifest discrepancy will be resolved between Clive and the generator or authorized representative and will be noted on the manifest which becomes part of the operating record. If the discrepancy is not resolved within 15 days, the Executive Secretary of the Utah Solid and Hazardous Waste Control Board is notified.

Container shipments are sampled as described in Section 4.8. The sample composites are analyzed for the acceptance parameters listed in Table 2. If the wastes can be managed and are not prohibited at the facility, the containers can then be accepted.

Each bulk liquid, sludge, and solid shipment is sampled as described in Section 4.9 and analyzed for the acceptance parameters listed in Table 2. If the waste can be managed and is not prohibited at the facility, the waste can then be accepted.

Upon acceptance the waste is placed into storage. The wastes may be stored and/or repackaged prior to shipment off-site. Each movement of a waste within the facility, during which any change in its characteristics may occur, makes the waste subject to additional inspection, sampling, and analysis to determine the appropriate handling and management of the waste. All of the analyses needed for the acceptance and storage functions are performed during incoming load verification. These are not repeated unless it is known or believed that the waste characteristics may change during storage or repackaging.

Prior to any mixing or commingling of any wastes, the wastes in question are subject to compatibility testing as described in EPA-600/2-80-076 or ASTM method 5058-90 Test Method A, prior to being commingled/mixed. If the wastes pass the compatibility testing, the mixing/commingling may proceed. Incompatible wastes are not mixed/commingled.

3.2 Waste that Inhibit Analysis

This section is designed for characterizing wastes where the material is homogeneous and could be sampled, but not easily analyzed. Examples include steel plates, glass, rocks, small identical

containers or objects, certain kinds of DOT 1.4, 1.5, and 1.6 explosives, transformer internals (windings, cores), and sealed containers such as capacitors and other sealed electrical devices that have historically contained PCBs. This category of material differs from debris (described in Section 3.3) in that it is homogenous (i.e., the contents of the entire drum or rolloff is all the same single material). It is limited to material consisting of relatively large objects that could not be readily analyzed (e.g., it would not apply to homogenous material such as soils, powders, pellets, etc.).

3.2.1 Profile Approval Process (Waste that Inhibits Analysis)

The profile approval process for waste that inhibits analysis is the same as that described in Section 3.1.1. The generator will also supply a picture or a detailed written description of the waste stream (meeting the requirements of ASTM method D4979-89).

3.2.2 Load Acceptance and Handling of Discrepancies (Waste that Inhibits Analysis)

The handling of discrepancies for waste that inhibits analysis is the same as that described in Section 3.1.2.

Prior to accepting the waste, the contents of each container or each bulk load are inspected for physical appearance. The person inspecting the material will provide a detailed written description or photo, or will transmit video to waste acceptance personnel so that they can easily determine if the waste matches the profile. Other information necessary to properly store the material (e.g., potential incompatibilities) will be obtained and evaluated from the profile information supplied by the generator.

If the waste consists of containers that contain more than four ounces of a material that could be analyzed, a representative sample of the material will be collected and analyzed for the parameters on Table 2 to determine appropriate management and storage of the waste.

3.3 Heterogeneous Debris

Debris differs from the material described in Section 3.2 in that it contains a wide variety of materials. In virtually all situations debris has one thing in common: non-hazardous materials are contaminated with organic and inorganic hazardous constituents. For example, it may contain a mixture of spill absorbent, Tyvek® suits, rubber booties and gloves, and paper towels. PCB contaminated "white fluff" falls into this category. Items that may not be part of a debris profile include containers containing any liquid. Although it may be possible to collect a sample of the debris, it would be difficult to collect a representative sample. If a representative sample could be collected, it would likely be very difficult to analyze since it would contain relatively large objects.

3.3.1 Profile Approval Process (Heterogeneous Debris)

The profile approval procedures for heterogeneous debris are identical to those for waste that inhibits analysis (Section 3.2.1).

3.3.2 Load Acceptance and Handling of Discrepancies (Heterogeneous Debris)

The procedures for accepting loads and handling discrepancies involving heterogeneous debris wastes are the same as those for waste that inhibits analysis (Section 3.2.2).

3.4 MSDS Wastes

This category of wastes is limited to material that is in its original unopened packaging (as a product). The packaging and labeling is still in good condition so that the contents are easily identified. The MSDS for the material is also available.

3.4.1 Profile Approval Process (MSDS Wastes)

The profile approval process for this category of wastes (MSDS wastes) is identical to that for routine wastes (3.1.1) except that the MSDS is submitted with the waste profile.

3.4.2 Load Acceptance and Handling of Discrepancies (MSDS Wastes)

The handling of discrepancies for MSDS wastes is the same as for routine wastes described in Section 3.1.2.

Prior to accepting the load, each container is inspected to ensure that the labeling is consistent with the MSDS. If containers in the load have been opened, they will be re-opened and the material will be visually compared to material in one of the unopened containers to ensure the material is the same. This will be documented in the operating record. Other information necessary to properly manage the material (e.g., flash point, potential incompatibilities, etc.) will be obtained and evaluated from the profile information supplied by the generator.

3.5 Transfer Operations

These are wastes that are manifested to another facility but are held temporarily (ten days or less) at the Clive facility during transit. The waste may be part of a load for which some of the material is destined for the Clive facility. When this material is shipped off-site, the original manifest accompanies the waste. This differs from wastes which are accepted for storage and then subsequently shipped to another facility. A new manifest is created with the Clive facility as the generator in this situation.

3.5.1 Profile Approval Process (Transfer Operations)

No profile approval procedures are necessary.

3.5.2 Load Acceptance and Handling of Discrepancies (Transfer Operations)

The load is not accepted but rather is held on a temporary basis. There are no requirements for sampling or ensuring the wastes are comparable to a profile. The Clive facility will comply with

the transporter requirements in Subpart C of 40 CFR §263 for these wastes. Also, if smaller containers are off-loaded from a trailer, the containers will be inspected to ensure they are in good condition.

3.6 PCB Only Wastes

These wastes are not hazardous waste under State of Utah or Federal RCRA regulations. These wastes include PCB Liquids, PCB Transformers/Bushings, PCB Debris (PPE, rags, wood, paper, gloves, etc. and empty PCB drums) and PCB Capacitors/Light Ballast.

3.6.1 Profile Approval Process (PCB Only Wastes)

PCB only wastes are categorized according to one of the previous waste categories defined in this plan and the follow the profile approval process for that category. The profile also requires the generator to certify that the waste is PCB only as defined above.

3.6.2 Load Acceptance and Handling of Discrepancies (PCB Only Wastes)

PCB only waste are categorized according to one of the waste categories identified in this plan and follow the procedures for load acceptance and handling discrepancies as outlined for that category of waste. In addition, PCB wastes will be identified by review of the manifest, shipping papers, visual inspection, labels on containers, and the Waste Profile Sheet supplied by the generator. If regulated PCBs are discovered in a waste whose manifest did not identify PCBs as a contaminant, a manifest discrepancy will exist. The generator will be required to explain how the PCBs came to be in the waste. If the explanation indicates that the waste should have been manifested as PCBs, the applicable portions of the 40 CFR Part 761, Subpart K, which may include filing an "Unmanifested Waste Report" will be followed.

Also during the incoming load evaluation,

-All PCB Containers, PCB Article Containers, and PCB Articles not in containers will be marked with the appropriate PCB Mark (if not already marked by the generator) to comply with the marking requirements of 40 CFR §761.40.

-Each PCB container from a shipment will be visually inspected to verify that it is not leaking. If a leaking container of PCB waste is discovered during the inspection, it will be re-packaged to prevent further leakage. The spill area will be decontaminated in accordance with 40 CFR Part 761 Subpart G. In addition, the transport vehicle bed will be inspected. In the case of flatbeds carrying PCB wastes, water or other free liquid found on the bed will be collected and managed as PCB waste or treated as a PCB spill and cleaned in accordance with 40 CFR Part 761 Subpart G.

Table 2 - Storage and Verification (Fingerprint) Analyses	
Parameter	**Rationale for Selection**
Physical Description	Used to determine the general characteristics of the waste stream and in evaluating the incoming load against the approved profile. Also used to ensure correct grouping of wastes for sampling and to detect discrepancies in waste types. Also used to determine which waste characterization procedure will be used.
pH	Used to determine the corrosivity of the waste to ensure proper storage of the waste.
Water Reactivity	Used to determine whether the waste has a potential to react with water to generate heat, flammable gases, or other products. It is also used to help identify prohibited wastes.
Reactive Sulfides Screen	Used to indicate whether the waste produces hydrogen sulfide upon acidification. This information is necessary in order to avoid storage and mixing incompatibilities.
Ignitability	Indicates the susceptibility of the waste to be ignited and can determine whether the waste is RCRA ignitable.
Reactive Cyanides Screen	Indicates whether the waste produces hydrogen cyanide upon acidification. This information is necessary in order to avoid storage and mixing incompatibilities.
Oxidizer Screen	A general qualitative test used to determine if a waste is an oxidizer. Oxidizers have the potential to react with a wide range of waste streams and therefore often need to be segregated.
Radioactivity Screen	It is used to help identify prohibited wastes.

4.0 Waste Sampling

This section presents methods utilized to obtain a representative sample of wastes. These methods apply to waste generated off-site as well as facility-generated waste. The specific sampling methods selected are dependent on the nature of the waste, its container, and its location.

4.1 Sampling Locations

Samples, including incoming load samples, may be taken from a variety of locations throughout the facility and from containers on the Northeast Casualty Real Property Clive rail spur. Waste may be sampled from drums, roll-off boxes, rail gondola cars, rail tank cars, lugger boxes, tanker or dump-type trucks, etc., or from other locations including containment areas.

4.2 Sampling Methods

The methods and equipment used for sampling vary with the form and consistency of the waste to be sampled. The appropriate representative sampling techniques, devices, and containers are selected from the EPA document, "Test Methods for Evaluating Solid Wastes" (SW-846) or "American Society for Testing and Materials" (ASTM) methods.

In order to determine the physical and chemical characteristics of a waste, a representative sample is needed. A representative sample is defined as a sample exhibiting average properties of the whole waste.

Sampling accuracy (the closeness of a sample value to its true value) and sampling precision (the closeness of repeated sample values) are the issues of importance. Thus, from both regulatory and scientific perspectives, the primary objectives of a sampling plan are to collect samples that allow accurate and precise measurements of the physical and chemical properties of the waste. If the chemical measurements are sufficiently accurate and precise, they are considered reliable estimates of the chemical properties of the waste. Statistical techniques for obtaining accurate and precise samples are relatively simple and easy to implement. Some form of random sampling usually achieves sampling accuracy. In random sampling, every unit in the population has a theoretically equal chance of being sampled and measured. Consequently, statistics generated by the sample are unbiased (accurate) estimators of true population parameters. In other words, the sample is representative of the population.

4.3 Traceability

Sample traceability for all internal sampling and analysis is followed. This involves the documentation of procedures so that a set of data can be traced back through the analyst, to the person performing the sampling, and then to the waste itself. All samples receive a unique sample identification number to facilitate this process.

4.4 Sampling Personnel

Trained personnel perform sampling. The laboratory manager or designee trains sampling personnel and observes their techniques periodically to ensure a thorough understanding of sample collection, storage, and transportation practices.

4.5 Sample Labels

Sample labels are necessary to provide identification of samples. The labels are affixed to the containers prior to or at the time of sampling. The labels are filled out at the time of collection and contain the following information:

- sample identification
- place of collection
- date and time of collection
- person sampling

4.6 Log Book

All information pertaining to sampling is recorded in a logbook, inspection or receiving report, or electronically. This record includes the following information:

- location of sampling point
- volume of sample taken
- date and time of collection
- sample identification number
- person sampling
- comments or observations
- sampling methodology
- number of samples and disposition

Sampling situations can vary widely; however, sufficient information is recorded to allow someone to reconstruct the sampling conditions without reliance on the collector's memory.

4.7 Sample Preservation

All samples are preserved in accordance with the parameter to be measured, as specified by the analytical method for that parameter.

4.8 Sampling of Containers

The term "container" refers to receptacles designed for transporting materials, e.g., drums and other small receptacles as opposed to stationary tanks. This section addresses the sampling of containers smaller than those carrying bulk materials. Sampling of bulk materials in large containers such as rolloffs, tank trucks, rail cars, etc. is addressed in Section 4.9. COLIWASAs, tubes, shovels, drum thieves, and triers are the devices used to sample containers.

A random sampling strategy is employed to sample incoming shipments of containerized waste. Samples from containers holding the same type of waste may be composited. The following procedure will be used to determine how many containers will be sampled and which samples

may be composited. Each container will be opened and visually inspected. Wastes on a single load that have the same profile number and DOT description (excluding waste codes) and appear to be of the same waste type may be grouped together. Ten percent (rounded up) of the containers in each of these groups will be sampled as described below. The samples within each separate group may be composited for analysis.

A unique tracking number is assigned to each container.

Samples are taken from locations displaced both vertically and horizontally throughout the waste. For liquids (or liquids with precipitated solids), the sampling person uses a COLIWASA or equivalent. The sampling device is inserted into the container from the top and is pushed down slowly until the bottom of the container is reached. The device is sealed to retain the contents. The contents of the sampling device are then transferred to a polyethylene or glass bottle, which is labeled with waste identification information. The sampling device may also be stoppered at both ends, wiped dry with a disposable cloth, and then transferred to the lab for analysis.

A trier or thief is used to sample containers holding material that is solid in nature. These containers are generally filled with dirt and sludges. Several areas from the container are sampled and composited into a jar in order to ensure a representative sample. The sampling person removes a sample that uniformly represents the waste composition of the container, i.e., all layers and phases are represented in the sample.

4.9 Sampling of Bulk Materials

Where sampling of bulk loads is required, each bulk container of each load will be sampled as described below.

Bulk solids in rolloffs or end dumps are sampled at two locations in the waste container. A trier, thief or shovel is used in order to draw a sample from as deep a cross section as possible at each location. The samples are composited together so that there is one sample which represents that particular bulk solids shipment.

Bulk liquids are sampled by using a COLIWASA or similar device which can sample vertical anomalies. Bulk sludges are sampled with a device appropriate for the consistency of the material. That may be a COLIWASA, trier, dip tube, thief, etc. Each compartment of tanker trucks is sampled. Compartment samples from the same generator and waste stream may be composited prior to analysis.

Tank trucks without man-ways are sampled through the valve. The valve is flushed prior to the sample actually being drawn.

An exception to the requirement for sampling each load of bulk load shipments is where a rail car of liquids or visibly similar solids is divided into multiple bulk tanker or truck loads for final shipment to Aragonite or Clive. This will only occur at the Bulk Solids Rail/Truck Transfer facility, Unit 255, and the Bulk Liquids Rail/Truck Transfer Bay, Unit 535, at the Clive facility.

In such cases, a representative sample will be taken from each rail car and that sample may be used as the incoming load sample for each of the individual truck or tanker loads from that rail car. For bulk solids, the sample from the rail car will consist of at least six sub-samples taken from equal areas in the rail car at depths of at least one foot. Alternatively, the sample could be collected by compositing at least three grab samples from the backhoe bucket while the waste is being transferred from the rail car to the end dumps or rolloff boxes. For liquids, a representative
sample will be taken with a COLIWASA from the hatch of the rail car. Samples will follow necessary chain-of-custody procedures to the laboratory at Aragonite.

4.10 Frozen Waste

Clive will not sample waste that is frozen. Loads may arrive at temperatures which prevent a representative sample from being obtained. Under such circumstances, the waste will be allowed to warm until such time as sampling can be performed. Loads that require thawing before sampling may be placed in the Thaw Unit, Unit 105 while awaiting sampling. If an incoming load is placed in Unit 105 for thawing prior to sampling (i.e., not yet accepted), it still must be sampled and a decision made regarding acceptance within the ten days of arrival at the facility. If an unaccepted load of waste is placed in Unit 105, the waste location must be documented in the operating record.

4.11 Other Samples

The sampling method for wastes in/on process equipment, containment and containment surfaces, sumps, etc., will vary with the nature of the waste material but will normally be grab samples or samples of specific locations. For grab samples the sampling device of choice is usually a scoop, shovel or similar device with a bottle in which to collect the sample. Sampling surfaces may involve removing a layer of the surface with a chisel or coring device or wiping the surface with material soaked in a solvent in which the chemical being tested for is at least 5% soluble. A dip tube or COLIWASA may also be used to sample sumps. 40 CFR 761.123 contains standardized EPA procedures for taking PCB surface wipe samples. The definition constitutes the minimum requirements for an appropriate wipe testing protocol. A standard size template (10 cm X 10 cm) is used to identify the sampling area; the wiping media is an all collection gauze pad which has been saturated with hexane. The wipe is performed quickly once the gauze is exposed to air.

5.0 Test Methods

The test methods to measure the parameters discussed throughout this plan are identified in Table 3. The Clive facility does not conduct analysis at the site. Incoming load samples and other samples are usually analyzed at the Clean Harbors Aragonite facility, but the Clean Harbors Grassy Mountain facility or another suitable off-site laboratory may be used to perform the required analyses. Whenever possible Aragonite uses established methods from Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, US EPA, 1986 and its updates. However, SW-846 does not have methods for all the parameters specified. In these particular cases, Aragonite uses other established methods, including American Society for Testing and Materials (ASTM); and EPA 600/4-79-020, Methods for

Chemical Analysis of Water and Wastes; Standard Methods for Examination of Water and Wastewater, Latest Edition; EPA 40 CFR, 136, Appendix A Methods; EPA Contract Laboratory Program, Inorganic SOW and Organic SOW Methods. Where other practical methods are not available, methods have been developed by Aragonite. These methods are described at the end of this section. Any laboratory performing analysis required by this plan must use the methods described in this plan.

When Clean Harbors Aragonite, or an off-site laboratory, performs analysis using a method found in SW-846 and the method is one that is certifiable by the State of Utah, the laboratory performing the analysis shall be State of Utah or NELAC certified for that method.

The letter following a method number indicates the SW-846 revision of that method. When new method revisions are promulgated by the EPA, they will be implemented within six months of promulgation. Thus, listed method numbers will remain constant, but suffixes (A, B, C, etc.) will depend on the latest EPA revision. Table 3 will be updated as soon as practical to include the latest promulgated method revisions. Utah certified laboratories used by Aragonite may have the prior revision designation on their certification as long as the method number reflects that listed in Table 3, analyses are actually performed and reported according to the latest revision, and the lab has applied for, and provided all necessary information to obtain certification for the new revision. If a lab has not yet implemented the update within the six months and it is necessary to use that laboratory, Aragonite may provide justification for using that lab and request a variance from the Executive Secretary.

TABLE 3 - ANALYTICAL PARAMETERS AND ASSOCIATED METHODS

PARAMETER	METHOD NUMBER	REFERENCE
*Acid-Base Partition Cleanup	3650A	(1)
Acid Digestion of Sediments, Sludges, and Soils	3050B	(1)
Acid Digestion of Aqueous Samples and Extracts for Total Metals for Analysis by Flame Atomic Absorption Spectroscopy or Inductively Coupled Plasma Spectroscopy	3010A-MOD	(1)
Acid Digestion of Aqueous Samples and Extracts for Total Metals for Analysis by Furnace Atomic Absorption Spectroscopy	3020A	(1)
*Alumina Column Cleanup	3610A	(1)
*Aluminum (AA)	7020	(1)
Aluminum (ICP)	6010A	(1)
Antimony (ICP)	6010A	(1)
*Antimony (AA)	7040, 7041	(1)
Aromatic Volatile Organics	8020A	(1)
*Aromatic and Halogenated Volatile Organics	8021A	(1)
Arsenic (ICP)	6010A	(1)
*Arsenic (AA)	7060A, 7061A	(1)
Ash	D482-87	(2)
Atomic Absorption Spectroscopy	7000A	(1)
Barium (ICP)	6010A	(1)
*Barium (AA)	7080A, 7081	(1)
Beryllium (ICP)	6010A	(1)
*Beryllium (AA)	7090, 7091	(1)
Bromide	9056	(1)
Cadmium (ICP)	6010A	(1)
*Cadmium (AA)	7130, 7131A	(1)
Calcium (ICP)	6010A	(1)

TABLE 3 - ANALYTICAL PARAMETERS AND ASSOCIATED METHODS

PARAMETER	METHOD NUMBER	REFERENCE
*Calcium (AA)	7140	(1)
*Carbamate pesticides (LCMS)	8321	(1)
Chloride	9252A, 9253	(1)
Chloride (Ion Chromatography)	9056	(1)
Chlorinated Herbicides	8150B, 8151A, 8150B/8151-MOD	(1) (1)
Chromium (ICP)	6010A	(1)
*Chromium (AA)	7190, 7191	(1)
Cobalt (ICP)	6010A	(1)
Cobalt (AA)	7201	(1)
Copper (ICP)	6010A	(1)
*Copper (AA)	7210, 7211	(1)
*Continuous Liquid-Liquid Extraction	3520B	(1)
Fluoride (Ion Chromatography)	9056	(1)
Fluoride	340.2 5050	(3) (1)
Florisil Column Cleanup	3620	(1)
Gas Chromatography	8000A	(1)
Gas Chromatography/Mass Spectrometry for Volatile Organics	8260B	(1)
Gas Chromatography/Mass Spectrometry for Semi-volatile Organics	8270C	(1)
*Gel-Permeation Cleanup (GPC)	3640A	(1)
Halogenated Volatile Organics	8010B	(1)
Headspace	3810	(1)
Heat of Combustion (BTU)	D240-87-MOD	(2)
Ion Chromatography	9056	(1)

TABLE 3 - ANALYTICAL PARAMETERS AND ASSOCIATED METHODS

PARAMETER	METHOD NUMBER	REFERENCE
Ignitability Liquid, actual flashpoint, no suspended solids	1020A, 1010	(1)
Ignitability Liquid, at 140ºF, no suspended solids	8b	(4)
Ignitability Liquid, room temperature	D4982-89	(2)
Ignitability Liquid, actual flashpoint, suspended solids (sludge)	1010	(1)
Ignitability Sludge, at 140ºF	8b	(4)
Ignitability Solids, room temperature	D4982-89	(2)
Ignitability Solids, at 140ºF	1020-MOD	(1)
*Iron (AA)	7380, 7381	(1)
Iron (ICP)	6010A	(1)
Lead (ICP)	6010A	(1)
*Lead (AA)	7420, 7421	(1)
LEL	14	(4)
Liquids, Sludge Compatibility (see note 3)	D5058-90 Test Method A	(2)
Magnesium (ICP)	6010A	(1)
*Magnesium (AA)	7450	(1)
Manganese (ICP)	6010A	(1)
*Manganese (AA)	7460, 7461	(1)
Mercury Cold Vapor (AA)	7470A, 7471A	(1)
Microwave Assisted Acid Digestion of Aqueous Samples and Extracts	3015	(1)
Microwave Assisted Acid Digestion of Sediments, Sludges, Soils and Oils	3051	(1)
Moisture (organic liquids)	D1533	(2)
Moisture (Inorganics)	2540B	(5)
Molybdenum (ICP)	6010A	(1)
*Molybdenum (AA)	7480, 7481	(1)

TABLE 3 - ANALYTICAL PARAMETERS AND ASSOCIATED METHODS

PARAMETER	METHOD NUMBER	REFERENCE
Nickel (ICP)	6010A	(1)
*Nickel (AA)	7520	(1)
Total Kjeldahl Nitrogen	D3590-89	(2)
Nitrate/Nitrite Ion Chromatography	9056	(1)
Nitrogen, Total	7.025-7.031	(7)
Nonhalogenated Volatile Organics	8015B	(1)
Organic Extraction and Sample Preparation	3500A	(1)
Organochlorine Pesticides	8080A, 8081A	(1)
*Organophosphorus Pesticides	8140	(1)
*Organophosphorus Compounds by Capillary Column GC	8141A	(1)
Oxidizer Screen	D4981-89	(2)
Paint Filter	9095	(1)
*PCDD	8280, 8290	(1)
*PCDF	8280, 8290	(1)
PCBs	8082	(1)
*PCB and Pesticides (GC/MS)	680	(6)
PCB Wipes	5503	(8)
pH Electrometric	9040B	(1)
pH Paper	9041A	(1)
pH Waste	9045C	(1)
pH Solids	9045C	(1)
Physical Description	D4979-89	(2)
Potassium (ICP)	6010A	(1)
*Potassium (AA)	7610	(1)

TABLE 3 - ANALYTICAL PARAMETERS AND ASSOCIATED METHODS

PARAMETER	METHOD NUMBER	REFERENCE
Purge-and-Trap	5030A	(1)
Radioactivity Screen	6	(4)
Reactive Cyanide Screen (Spot Test) Confirmation (see note 2)	D5049-90 Test Method A	(2)
Reactive Cyanide Screen (Drager) Prime (see note 2)	D5049-90 Test Method D	(2)
Reactive Sulfide Screen (Spot Test) Confirmation (see note 2)	D4978-89 Test Method A	(2)
Reactive Sulfide Screen (Drager) Prime (see note 2)	D4978-89 Test Method B	(2)
Cyanide (Releasable)	Chapter 7, Sec. 7.3.3.2	(1)
Sulfide (Releasable)	Chapter 7, Sec. 7.3.4.2	(1)
Selenium (ICP)	6010A	(1)
*Selenium (AA)	7740, 7741A	(1)
Separatory Funnel Liq-Liq Extraction	3510B	(1)
Silica Gel Cleanup	3630B	(1)
Silver (ICP)	6010A	(1)
*Silver (AA)	7760A, 7761	(1)
Sodium (ICP)	6010A	(1)
*Sodium (AA)	7770	(1)
Solids Compatibility	N/A	(9)
Sonication Extraction	3550A	(1)
Soxhlet Extraction	3540B	(1)
Specific conductance	120.1	(3)
Specific Gravity	D1429-86-MOD	(2)
*Sulfides	9030A, 9031	(1)
Sulfate Ion Chromatography	9056	(1)
*Sulfur	D2784-89, D1266-87	(2)

TABLE 3 - ANALYTICAL PARAMETERS AND ASSOCIATED METHODS

PARAMETER	METHOD NUMBER	REFERENCE
Sulfur Cleanup	3660A	(1)
Sulfuric Acid Cleanup	3665	(1)
Thallium (ICP)	6010A	(1)
*Thallium (AA)	7841, 7840	(1)
Tin (ICP)	6010A	(1)
TCLP	1311	(1)
Total and Amenable Cyanide (Colorimetric, Manual)	9010A	(1)
*Total and Amenable Cyanide (Colorimetric, Automated UV)	9012	(1)
Total Organic Carbon	9060	(1)
Total Halogen	5050, 9253	(1)
Vanadium (ICP)	6010A	(1)
*Vanadium (AA)	7910, 7911	(1)
Viscosity	D2983-87	(2)
Waste Dilution	3580A	(1)
Water Reactivity Screen (see note 1)	D5058-90 Test Method C	(2)
Zinc (ICP)	6010A	(1)
*Zinc (AA)	7950, 7951	(1)

** Non-Aragonite laboratory only*

TABLE 3
ANALYTICAL PARAMETERS AND ASSOCIATED METHODS

(1) Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA Publication SW-846 [3rd Edition (November, 1986), with current updates]

(2) American Society for Testing and Materials

(3) Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020

(4) Aragonite Methods

(5) Standard Methods for the Examination of Water and Wastewater, Latest Edition, APHA, WEF

(6) Alford-Steven, A.; Eichelberger, J.W. and Budde W.L. Method 680. Determination of Pesticides and PCBs in Water and Soil/Sediment by Gas Chromatography/Mass Spectrometry. Physical and Chemical Methods Branch. Environmental Monitoring and Support Laboratory Office of Research and Development. U.S. EPA, Cincinnati, Ohio 45268. November 1985.

(7) Association of Official Analytical Chemists, 14th Edition

(8) National Institute for Occupational Safety and Health

(9) A Method for Determining the Compatibility of Hazardous Wastes, EPA-600/2-80-076, April, 1980

NOTES:

1. A significant temperature change as called out in paragraph 24.8 of ASTM method D5058-90 is defined as ≥15ºC. The test does not apply to wastes already in contact with excess water, nor is a waste water reactive if the heat generation is due solely to a strong acid/base reaction as verified by pH analysis. Occurrence of the reactions listed in paragraph 24.4 of ASTM method D5058-90 result in failure of the water reactivity test, except that formations of precipitates or emulsions are considered failures only if the ability to mix and pump the resulting liquids is impaired.

2. The test is not required for wastes with pH <6.

3. A temperature rise as called out in paragraph 11.8 of ASTM method D5058-90 is defined as ≥15ºC. Occurrence of the reactions listed in paragraph 11.7 of ASTM method D5058-90 result in failure of the compatibility test, except that formations of layers, precipitation, emulsification, or increases in viscosity are considered failures only if the ability to mix and pump the resulting liquids is impaired.

Aragonite Methods

Radioactivity Screen (Aragonite-6)

All incoming waste shipments will be monitored for radioactivity using a count rate meter with a Geiger-Mueller (GM) detector. The detector window shall have at least a 2.54 centimeters diameter opening utilizing window material of approximately 1.7 milligrams per square centimeter. The detector shall be operated in accordance with the manufacturer's recommended procedures. Detectors shall be calibrated at least annually and after repair.

The detector window shall be placed within one (1) inch (but not in contact) of the sample surface of bulk materials until a steady, time weighted count rate is obtained. Three (3) measurements shall be taken of each sample and recorded.

Results of surveys are to be recorded in terms of counts per minute. Any waste found to have a count rate exceeding background by three (3) times or greater for any measurement shall not be accepted without receiving authorization from the Utah Division of Radiation Control. A background reading shall be taken for each sampling day prior to each sample event and the measurement recorded.

Ignitability Screen for Sludges (Aragonite-8b)

The ignitability screen for sludges is determined using a modified version of EPA SW-846 Method 1010. Instead of an actual flash point determination as outlined in the 1010, the sludge is heated in the test cup to 140˚F. When the temperature in the cup reaches 140˚F, the flame is applied to the sample. A flash/no-flash measurement is determined and recorded as positive or negative.

LEL (Aragonite 14)

This method is used for the determination of the presence of explosive vapors dissipating from a waste. A quantitative result in % LEL is indicated on the instrument.

Containers of waste are opened enough to insert the probe. The instrument pulls any vapors above the waste into the detectors. Sufficient time must be allowed to clear the air from the sample line. The container is sampled immediately after opening. The probe inlet is placed close to, but not touching, the waste in the container. The result in % LEL is recorded in the logbook. Care must be exercised to ensure that drafts are avoided in the area that is being sampled as this can cause an erroneous result. The test is not to be run on materials that will poison the detector.

The instrument will be calibrated according to the procedures and at the frequency specified by the manufacturer. It will be operated according to the instructions provided by the manufacturer. Daily sensitivity checks and continuing sensitivity checks every twentieth sample will be conducted. The test will not be run with an instrument that is not functioning correctly.